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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,384	07/22/2003	Alexander Leybovich	020324 227P2	6818

33805 7590 03/22/2005

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/624,384

Applicant(s)

LEYBOVICH, ALEXANDER

Examiner

Steven H VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Double Patenting

1. Applicant is advised that should claim 2 be found allowable, claim 7 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 7 recites the limitation "The system" in line 1. There is insufficient antecedent basis for this limitation in the claim. I recommend changing claim 7 to depend from claim 6 to overcome the rejection.

5. Claim 8 recites the limitation "said low-k dielectric material" in line 1. There is insufficient antecedent basis for this limitation in the claim. I recommend changing claim 8 to depend from claim 7 to overcome the rejection.

6. Claim 9 recites the limitation "said low-k dielectric material" in line 1. There is insufficient antecedent basis for this limitation in the claim. I recommend changing claim 9 to depend from claim 7 to overcome the rejection.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,292,122 to Katsube et al. (Katsube).

9. For claim 1, Applicant requires a method for the physical vapor deposition of dielectric material onto a substrate comprising forming an energized monochromatic ion beam; converting the ion beam into an energized monochromatic beam of neutrals; directing the beam toward a sputtering target; exposing the target to bombardment by the beam; sputtering particles from the target; forming a cloud of the sputtered particles proximate to a substrate; and depositing the particles onto the substrate.

10. Katsube discloses forming an ion beam; converting it to a fast atom beam; bombarding the sputtering target; forming a cloud of particles near the substrate; and depositing the particles onto the substrate (Embodiment 2).

11. For claims 2 and 7, Applicant requires the target to comprise a low-k dielectric material. For claim 3, Applicant requires the material to be organic. For claim 4, the material is inorganic. For claim 5, the dielectric constant is about 1.3 to 3.7. Katsube discloses the dielectric constant to be 2.2 for polytetrafluoroethylene (organic) at 8kv (Experiment 2) and 2.1 for Teflon (inorganic) (Experiment 4).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,296,122 to Katsube in view of *New high-power fast atom beam source* by Shimokawa et al. (Shimokawa).

14. For claim 6, Applicant requires a system for the physical vapor deposition of dielectric material onto a substrate comprising a sputtering target; a low energy, large aperture ion source of energized monochromatic ions; an ion optics system for equalizing, shaping, and directing ions into an ion beam; a charge transfer system for neutralization of the ion beam into a beam of neutrals; means for directing the beam of neutrals toward the target so that the beam bombards the target and causes the target to emit sputtered particles; means for forming a cloud of sputtered particles proximate the substrate; and means for depositing the cloud of particles onto the substrate.

15. Katsube is described above, but does not disclose the specifics of the ion/neutral beam source. Katsube does disclose the use of a sputtering target, forming the cloud (hence the means to form it) and depositing onto the substrate (hence the means to deposit).

16. Shimokawa discloses a new fast atom beam (FAB) source that uses an electromagnet for the benefit of higher plasma densities (abstract). The FAB comprises a low energy, large aperture ion source of energized monochromatic ions; an ion optics system for equalizing,

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shaping, and directing the ions into an ion beam; a charge transfer system; and means for directing the beam toward the target.

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Katsube to utilize the FAB of Shimokawa because of the desire to have a higher plasma density.

18. For claim 8, Applicant requires the low-k dielectric material to be organic. For claim 9, Applicant requires the low-k dielectric material to be inorganic. As noted above, Katsube discloses the limitations (Experiments 2 & 4).

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

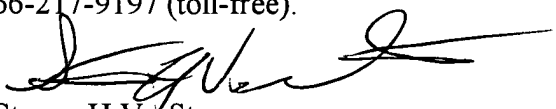
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
March 17, 2005